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14

SYLLABUS

OF

THE COURSE OF LECTURES

ON

BOTANY,

DELIVERED IN COLUMBIA COLLEGE,

BY DAVID HOSACK, M. D. F. L. S.

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IN THE UNIVERSITY OF THE STATE OF NEW-YORK.

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1814.

*At a meeting of the Trustees of Columbia College, held at
the College Hall, on Monday, the ninth day of July, 1792,*

ORDINED, That every Professor of this College who teaches by Lecture, do publish, within one year, a Syllabus of his Course of Lectures.

Extract from the Minutes,

ROBERT HARPUR, Clk.

At the request of a number of students of medicine, the present Syllabus of the Course of Lectures on Botany, delivered for a series of years in Columbia College, while the author held the professorship of botany in that institution, is reprinted. It is republished from the copy drawn up and printed in 1795.-

SYLLABUS, &c.

PART I.

STRUCTURE AND FUNCTIONS OF VEGETABLES.

A.

GENERAL DIVISION OF NATURAL HISTORY.

1 METEOROLOGY	History of the	ATMOSPHERE,
2 HYDROGRAPHY		WATERS,
3 GEOLOGY		EARTH,
4 ZOOLOGY		ANIMAL
5 BOTANY		VEGETABLE
6 MINERALOGY		MINERAL

Kingdoms.

—Division of bodies into *animal*—*vegetable*, and *mineral*, considered—objec-

tions to—

Opinions of *Tournefort*, *Linnæus*, &c. examined.—

Minerals—characters which distinguish them from animals and vegetables—

Vegetables—their near approach to the animal kingdom—

Distinctions proposed by

JUNGIUS,
BOERHAAVE,
TOURNEFORT,
LUDWIG,
LINNÆUS,
ALSTON,
HEDWIG, &c.

Corals and *Zoophytes*, referred by some authors to the vegetable and fossil kingdoms—their *animal* nature illustrated by the discoveries of *Peyssonnel*, *Trembley*, *Jussieu*, *Donati*, *Ellis*, &c.—

B.

COMPARISON OF PLANTS AND ANIMALS.

- 1 Their origin.
 - 2 Growth and manner of receiving nourishment.
 - 3 Food.
 - 4 Climate.
 - 5 Secretion and excretion.
 - 6 Sensation—volition—motion—sleep—watching.
 - 7 Sexes.
 - 8 Propagation.
 - 9 Diseases.
 - 10 Death.
 - 11 Natural decomposition.
 - 12 Chemical Analysis.
- CONCLUSION**—Animals and Vegetables, links of the same chain of being—objections to, by some Metaphysicians, considered.

C.

GENERAL ARRANGEMENT OF VEGETABLES.

- 1 Palms.
- 2 Trees.
- 3 Shrubs.
- 4 Herbs.
- 5 Grasses.
- 6 Ferns.
- 7 Fungi.
- 8 Mosses.
- 9 Algæ.

—Characters of each illustrated.—

D.

COMPONENT PARTS OF A PLANT.

- 1 Root.
- 2 Trunk.
- 3 Branches.
- 4 Leaves.

- 5 Supports.
6 Flower.
7 Fruit.

—Exceptions to—

E.

ANATOMY OF PLANTS.

A.—SOLIDS.

- 1 Epidermis.
2 Rete Mucosum.
3 Cortex—its inner layer LIBER—
4 Alburnum.
5 Lignum.
6 Medulla.
7 Vasa Propria.
8 Tracheæ, or air vessels—have no existence.—

—Structure and functions of plants illustrated by dissection and experiment—

B.—FLUIDS.

(a.)—NUTRITIOUS FLUIDS.

- 1 Lymph.
2 Sap.

--Circulation of the sap disproved--doctrine of the Ancients--experiments of HALES, HOPE, WALKER, &c.

(b)—SECRETED FLUIDS.

- 1 Gums.
2 Resins.
3 Gum Resins.
4 Balsams.
5 Oils—fixed and volatile.
6 Aroma—grateful and poisonous.
7 Water.
8 Vital air.

C.—ANOMALOUS SUBSTANCES.

1 Saline Substances.

- i Sugar,
- ii Manna,
- iii Nectar,

2 Farina,

3 Fœcula,

4 Colouring Matter.

—Observations on colours, and the principles of dyeing.—

F.

CHEMICAL ANALYSIS OF VEGETABLES.

1 Oxygen,	{	Common to all vegetables*
2 Hydrogen,		
3 Carbon,		
4 Nitrogen,	{	Contained in particular vegetables†
5 Phosphorus,		
6 Sulphur,		
7 Acids,		
8 Alkalies,		
9 Earths, Metals,		

G.

FOOD OF PLANTS.

- 1 Air,
- 2 Water,
- 3 Earth,
- 4 Heat,
- 5 Light.

—All necessary to the perfect growth of plants--illustrated by experiments and observations.—

—Experiments of VAN HELMONT,

BOYLE,
HALES,
DU HAMEL,
TILLETT,
HASSENFRATZ,
SENEBIER, &c.—

—Chemical Analysis of the *food* of plants compared with the Chemical Analysis of *plants*.—

H.

SOILS.

- 1 Variety.
- 2 Composition.
- 3 Manner of Operation.

I.

MANURES.

- 1 Animal.
- 2 Vegetable.
- 3 Mineral.
- 4 Electricity.

—Operation of Manures—how far useful or injurious.—

K.

OF THE SEED.

A.—DIFFERENT KINDS.

- 1 Seed properly so called.
- 2 Nux.
- 3 Propago.

B.—COMPONENT PARTS OF THE SEED.

- 1 Arillus,
- 2 Hilum,
- 3 Foramen,
- 4 Cotyledon,
- 5 Coreulum,
 i Plumula,
 ii Radicula,
- 6 Corona,
- 7 Ala.

—Structure and Functions of each illustrated by dissection and experiments.

C.—VEGETATION OF THE SEED.

- | | | | |
|-----------------|---|--------------------------|-----------------------------------|
| 1 Impregnation. | } | Necessary to Vegetation. | |
| 2 Air. | | | |
| 3 Moisture. | | | |
| 4 Heat. | | | |
| 5 Light, | | | Not essential to the first growth |
| 6 Earth, | | | |
- Experiments of CURTIS, &c.— process of Vegetation described.

D.—PROPAGATION.

(a.)—NATURAL PROPAGATION.

- 1 Seeds.
- 2 Roots.
- 3 Suckers.
- 4 Stems.
- 5 Bulbs.
- 6 Leaves.

(b.)—ARTIFICIAL PROPAGATION

- 1 Cutting.
- 2 Layers.
- 3 Engrafting.
- 4 Inoculation.

—Structure of Buds—

—Equivocal generation, objections to—

I.

OF THE ROOT.

A.—DIFFERENCE OF STRUCTURE AND SHAPE.

- 1 Bulbous.
- 2 Tuberous.
- 3 Fibrous.

B.—MANNER OF GROWTH.

- 1 Creeping.
- 2 Horizontal.
- 3 Perpendicular.

C.—DURATION.

- 1 Annual.
- 2 Biennial.
- 3 Perennial.

—Exceptions from Culture, Climate, &c.

M.

OF THE TRUNK.

A.—DIFFERENT KINDS.

- 1 Caulis.
- 2 Culmus.
- 3 Scapus.
- 4 Frons.
- 5 Stipes.

B.—DIFFERENT SPECIES ARISING FROM—

- 1 Structure.
- 2 Height.
- 3 Direction.
- 4 Shape.
- 5 Surface.
- 6 Composition.
- 7 Branches.
- 8 Colour.

—Illustration.—

N.

OF THE LEAVES.

A.—COMPONENT PARTS OF A LEAF.

(a.)—*FOLIUM.*

- 1 Its base.
- 2 Apex.
- 3 Surfaces.
- 4 Parenchyma.

(b.)—PETIOLES.

- 1 Its shape.
- 2 Length.
- 3 Insertion.
- 4 Direction.
- 5 Surface.

B.—SIMPLE LEAVES.

- 1 Place of insertion.
- 2 Manner of insertion.
- 3 Relative situation.
- 4 Direction.
- 5 Shape.
- 6 Surface.
- 7 Length and expansion.
- 8 Substance.
- 9 Duration.—

C.—COMPOUND LEAVES.

—Degree of Composition.

—Illustration.—

D.—FUNCTIONS OF LEAVES.

- 1 Use in the vegetable economy as organs of respiration.
- 2 Influence upon the atmosphere.—

Experiments of MILLER,

HALES,

MARIOTTE,

BONNET,

DU HAMEL,

PRIESTLEY,

INGENHOUZ,

SENEBIER.

O.

FULCRA, OR MORE PROPERLY APPENDAGES.

- 1 Stipulae.
- 2 Bracteæ.
- 3 Cirrus.

- 4 Spini.
- 5 Aculei.
- 6 Pili.
- 7 Glandula.—

—Illustration.—

P.

ORGANS OF FRUCTIFICATION.

A.—PEDUNCULUS.

- 1 Its composition.
- 2 Place of insertion.
- 3 Relative situation.
- 4 Direction.
- 5 Structure.

B.—RECEPTACULUM.

- 1 Its composition.
- 2 Surface.

C.—CALYX.

- 1 Perianthium.
- 2 Involucrum.
- 3 Gluma.
- 4 Spatha.
- 5 Calyptra.
- 6 Volva.

Characters of each

- 1 Shape.
- 2 Number.
- 3 Divisions.
- 4 Number of pieces.
- 5 Situation.
- 6 Colour.
- 7 Duration.

D.—COROLLA

- 1 Its shape.
- 2 Regularity.

- 3 Divisions.
- 4 Number of pieces.
- 5 Place of insertion.
- 6 Colour.
- 7 Duration.—

E.—STAMINA.

(a.)—FILAMENTUM.

- 1 Its length.
- 2 Proportion.
- 3 Figure.
- 4 Number.
- 5 Connexion.
- 6 Insertion.

(b.)—ANTHERA.

- 1 Shape.
- 2 Number.
- 3 Disposition.
- 4 Structure.
- 5 Pollen.

E.—PISTILLUM.

(a.)—GERMEN.

- 1 Its situation.
- 2 Structure.

(b.)—STYLU.S.

- 1 Shape.
- 2 Number.
- 3 Division.
- 4 Length.
- 5 Direction.

(c.)—STIGMA.

- 1 Shape.
- 2 Number.—

Sexes of plants—imperfectly known to the ancients—demonstrated by
Linnaeus—

Experiments of LINNÆUS,
SMITH, &c.

Objections of—**ALSTON**—

—**SMELIE**—

—**SPALLANZANI**—considered—

G.—PERICARPIUM.

- 1 Capsula.
- 2 Conceptaculum.
- 3 Siliqua
- 4 Legumen.
- 5 Drupa.
- 6 Pomum.
- 7 Bacca.
- 8 Strobilus.—

H.—SEED.

—(SEE K. PAGE 9.)

Q.

INFLORESCENCE.

- 1 Spadix.
- 2 Verticillus.
- 3 Capitulum.
- 4 Spica.
- 5 Panicula.
- 6 Amentum.
- 7 Racemus.
- 8 Fasciculus.
- 9 Umbella.
- 10 Cyma.
- 11 Corymbus.
- 12 Thyrus.

—Illustration —

—Calendarium Flora, &c. &c

PART II.

SYSTEMATIC ARRANGEMENT OF VEGETABLES.

A.

HISTORY OF BOTANY.

FIRST PERIOD.

I. STATE OF BOTANY AMONG THE GRECIANS.

HIPPOCRATES,	400 years B. C.
THEOPHRASTUS—"Historia Plantarum"—500 plants	320 B. C.

II. STATE OF BOTANY AMONG THE ROMANS.

DIOSCORIDES—600 plants—	70 A. C.
PLINY—Compilation—10,000 plants—	74
GALEN—	131
—Destruction of the Roman Empire—	
—Decline of Learning until the eighth century—	
—Learning revived by the Arabians.—	

III. STATE OF BOTANY AMONG THE ARABIANS.

Translations and compilations from the Grecian and Roman writings—	
—Decline of Learning until the fifteenth century—	

SECOND PERIOD.

—Age of Commentators and Translators,	1500
BRUNFELSIUS—first accurate prints of plants,	1522
First public Botanic Garden at Padua,	1533
CONRAD GESNER—first Museum in Natural History—first suggested a systematic arrangement of plants into class—order—genus, and species,	1560
CÆSALPINUS—improved the proposed classification of Gesner,	1583
F. COLUMNA—first copperplates—improved the genera of plants, and Botanic language,	1592
J. BAUHIN, "Historia Plantarum Universalis,"	1613
CASPAR BAUHIN, "Pinax Theatri Botanici," 6,000 plants—with synonomies of the ancients,	1628

PARKINSON—“Theatrum Botanicum,”	1640
JUNGIUS—“Doxoscopiae Physice Minores”—containing the first principles of Linnean classification,	1657
SOCIETIES for promoting knowledge.	
Royal Society of London,	1665
Royal Academy of Sciences at Paris,	1666
GREW—“Anatomy of Plants,”	1671
MALPIGHIUS—“Anatomia Plantarum,”	1675
RHEEDE—“Hortus Malabaricus,”	1676
MORISON—“Historia Universalis Plantarum”—a new system of arrangement,	1678
RAY—“Methodus Plantarum Nova Synóptica,”	1682
“Historia Plantarum Generalis,”	1686
“Synopsis Method Stirpium Britannicarum,”	1690
HERMAN, New System—“Flora Lugduno Batava,”	1690
RIVINUS, New System,	1690
PLUMIER—“Description des plantes de l'Amérique,”	1693
SIR HANS SLOANE—“Natural History of Jamaica,”	1696
TOURNEFORT—New System—improved the genera—	1697
KÖMPFER—“Amenitatis Exoticæ.”	1712
SCHEUCHZER—Agrostographia	1. 9
BOERHAAVE—New System,	1720
MAGNOL—New System,	1720
HALES—“Vegetable Statics,”	1727
MICHELII—CRYPTOGAMIA,	1729
CATESBY—“Natural History of Carolina,” &c.	1731

THIRD PERIOD.

LINNÆUS—Sexual System—	
“Fundamenta Botanica,”	1735
“Species Plantarum,” 1753.	
“Genera Plantarum,” new edition by Schreber, 1789.	
“Systema Vegetabilium,” 14th edition by Murræ, 1784.	
Do. do. by Gmelin, in his “Systema Natura Linnæi,” 1791.	
“Philosophia Botanica.”	
“Amenitatis Academicæ,” new edition, by Schreber, 1787.	
“Flora Lapponica,” new edition, by Smith, 1792.	
“Prælectio[n]es in Ordines Naturales,” by Giseke, 1792.	
&c. &c. &c.	
DILLENIUS—“Historia Museorum,”	1741
RUMPHIUS—“Herbarium Amboinense,”	1741
HALLER—“Stirpes Helvetiorum.”	1742

LUDWIG—“ <i>Institutiones Regni Vegetabilis,</i> ”	1742
CLAYTON—“ <i>Flora Virginica,</i> ”	1742
GMLIN—“ <i>Flora Iberica,</i> ”	1747
ALSTON—“ <i>Tyrcinum Botanicum,</i> ”	1753
BONNET—“ <i>Recherches sur l'usage des feuilles,</i> ”	1758
DU HAMEL—“ <i>Physique des Arbres.</i> ”	
BERNARD DE JUSSIEAU—“ <i>Genera Plantarum secundum ordines naturales disposita.</i> ”	1759
Do. new edition by Paulus Usteri, 1791.	
HUDSON—“ <i>Flora Anglicana,</i> ”	1762
ADAVSON—“ <i>Familles des Plantes,</i> ”	1763
SIR JOSEPH BANKS, {	1763
DR. SOLANDER, }	
JACQUIN—“ <i>Historia Stirpium Americanarum,</i> ”	1763
“ <i>Hortus Vindebonensis,</i> ” 1770.	
“ <i>Flora Austriaca,</i> ” 1773.	
FLORA DANICA.	1766
SCHREBER—“ <i>History of Grasses,</i> ”	1769
SIR JOHN HILL—“ <i>Vegetable system,</i> ” new system,	1773
AUBLET—“ <i>Guiana,</i> ”	1775
CURTIS—“ <i>Flora Londinensis,</i> ”	1777
“ <i>Observations on Grasses,</i> ” 1790.	
“ <i>Botanical Magazine,</i> ” 1793.	
“ <i>Observations on vegetation,</i> ” &c. &c. &c. .	
LIGHTFOOT—“ <i>Flora Scotica,</i> ”	1778
LA MARCK—“ <i>Flore Francoise</i> ”—new system—	1778
HEDWIG— <i>Cryptogamia,</i>	1782
PALLAS—“ <i>Flora Rossica,</i> ”	1784
L'HERETIER—“ <i>Geraniologia</i> ”—“ <i>Sertum Anglicum,</i> ”	1784
THUNBERG—“ <i>Flora Japponica,</i> ”	1784
MARSHALL—“ <i>Arbustum Americanum,</i> ”	1785
DICKSON—“ <i>Cryptogamia,</i> ” &c. &c. &c.	1785
WALTHER—“ <i>Flora Caroliniana,</i> ”	1788
GÆRINGER—“ <i>De Fructibus et Seminibus plantarum,</i> ”	
—New System,	1788
SMITH—“ <i>Reliquæ Rudbeckianæ,</i> ”	1789
“ <i>Icones Plantarum hactenus ineditæ,</i> ” 1789.	
“ <i>Icones Pictæ Plantarum Rariorum,</i> ” 1790.	
“ <i>Spicilegium Botanicum,</i> ” 1791.”	
“ <i>Botany of New Holland,</i> ” 1793, &c. &c. &c.	
ENGLISH BOTANY,	1790
WO'DVILLE—“ <i>Medical Botany,</i> ”	1790
Transactions of the Linnæan Society of London,	1791
MARTYN—“ <i>Flora Rustica,</i> ”—“ <i>Language of Botany,</i> ” &c. &c. &c.	1793

B.

LINNEAN ARRANGEMENT.

A.—ARTIFICIAL, OR SEXUAL SYSTEM.

—Divided into—

- 1 Classes.
- 2 Orders.
- 3 Genera.
- 4 Species.
- 3 Varieties.

—Characters of each—

(a.)—CLASSES FORMED FROM

- | | | |
|----------------------|---|-----------------|
| 1 The number | } | Of the Stamina. |
| 2 Place of insertion | | |
| 3 Proportion | | |
| 4 Connexion | | |
| 5 Disposition, &c. | | |

—Illustration—

(b.)—ORDERS FORMED FROM

- | | | |
|---------------------------------|---|------------------|
| 1 The number | } | Of the Pistilla. |
| 2 Fertility | | |
| 3 Situation | | |
| 4 Structure of the Pericarpium. | } | Of the Stamina. |
| 5 Number | | |
| 6 Connexion | | |
| 7 Disposition, &c. | | |

—Illustration—

(c.)—GENERA FORMED FROM THE ORGANS OF FRUCTIFICATION.

(d.)—SPECIES FORMED FROM

- 1 The Root.
- 2 Trunk.
- 3 Branches.

4 Leaves.

5 Fulera, &c.

(e.)—VARIETIES—THE EFFECTS OF CLIMATE, CULTURE, &c.

—Illustration—

—Alterations of the Linnæan System, proposed by Thunberg—Gmelin, &c.—

B.—NATURAL ORDERS OF LINNÆUS.

—Illustration—

C.

SYSTEM OF JUSSIEAU.

—Compared with the natural orders of Linnæus—

—Advantages of each.—

D.

—Plants useful in Diet—Medicine—Agriculture, &c. illustrated with practical observations—

E.

—Herbarium—advantages of—manner of preserving and arranging plants—

—CONCLUSION.—

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